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These records tell us, among other things:

(a) That through the first ten thousand feet next the earth the temperature changes irregularly, and often has one or more layers warmer than the regions immediately below or above them.

(b) That roughly between ten thousand and forty thousand feet above the surface of the earth the temperature falls tolerably regularly, approximately at the rate of  $0^{\circ}.7$  C. per hundred meters, or  $0^{\circ}.4$  F. per hundred feet.

(c) That somewhere in the neighborhood of forty thousand feet elevation the temperature quits falling, usually abruptly, and commonly increases slowly from this level up to the greatest elevation yet reached, about 26.6 kilometers ( $16\frac{1}{2}$  miles).

The place where the temperature quits falling and begins to rise is called the inversion level. Its elevation and its temperature both change with seasons, with latitude, and with storm conditions.

This inversion and all the other phenomena connected with the temperature gradients of the atmosphere appear to be satisfactorily accounted for by the known constitution of the atmosphere and the laws of radiation and absorption.

The paper in full appears in the *Astrophysical Journal*, January, 1909.

*Some Results in Solar Magnetism:* W. J. HUMPHREYS, Mt. Weather Observatory, Md.

The splendid work of Hale and others at Mount Wilson has led to the conclusions: (a) that sun spots are cooler than the surrounding regions; (b) that they are centers of violent cyclones; (c) that they are accompanied by magnetic fields of great intensity.

Assuming the effective temperature of the sun to be  $6,000^{\circ}$  C., simple convection can reduce the temperature of solar vapor to about  $5,000^{\circ}$  C., so that lower temperatures, if such exist, must be due to some such explosive action as Fox has shown to accompany the spots.

The observed tangential velocity of 100 kilometers per second can not be accounted for as the result of simple differences in barometric gradients.

The observed magnetic field can not be due to a whirling surface charge, since a charge sufficient to produce it would cause disruptive radial forces. A volume charge, however, of the negative sign, analogous to that which somehow exists in the earth's atmosphere might lead to the observed effects.

The magnetic fields of the sun spots, however produced, can not extend in measurable amounts to the earth, and therefore our magnetic storms are still without a definitely assignable cause.

The full paper appears in *Terrestrial Magnetism and Atmospheric Electricity*, December, 1908.

*Note on Thermoluminescence:* ELIZABETH R. LAIRD, Mt. Holyoke College.

Theory suggests that the change producing luminescence goes on very slowly at ordinary temperatures in thermoluminescent salts and is merely accelerated by raising the temperature. An additive method of obtaining the effect of thermoluminescence should therefore show its existence at room temperatures.

This was tested by wrapping up photographic plates for different periods of time with sensitive film toward a thermoluminescent salt and developing later, at the same time heating the salt to observe the remaining effect.

The salts used were solid salt solution of calcium sulphate and magnesium sulphate, the same with an undetermined admixture and calcium sulphide which had been kept in the dark some time after all visible luminescence had ceased.

The results showed that the photographic plate was unaffected in each case, with exposures varying from two weeks to two months, according to the salt used and the amount of its previous exposure to light. Where the effect was uneven the greater effect corresponded to the portions showing brighter thermoluminescence. Control plates used with salt that had not been exposed to light after heating showed no effect in the same time.

These experiments indicate that there is a slow change in thermoluminescent salts, probably similar to that occurring at a higher temperature.

ALFRED D. COLE,  
Secretary

#### THE AMERICAN PHYSIOLOGICAL SOCIETY

THE American Physiological Society met in the physiological laboratory of the Johns Hopkins University, December 28 to 31. Sessions for the reading of papers were held in the forenoons of December 29, 30, 31 and the afternoon of December 31. Demonstrations were given in the afternoon. Seventy papers and demonstrations were presented.

A joint session with the American Society of Biological Chemists was held December 29. On the afternoon of the twenty-ninth the society met with Section K to hear the address of the retiring

vice-president (Dr. L. Hektoen) and for a symposium upon the subject of "The Regulation of Physical Instruction in Schools and Colleges from the Standpoint of Hygiene." On the afternoon of the thirtieth there was a combined meeting with Section K, the Society of American Bacteriologists and the American Society of Biochemists. The following general papers were read and discussed:

"Anaphylaxis," by M. J. Rosenau.

"The Physiological Significance of Creatin and Creatinin," by L. B. Mendel.

"The Cause and Diagnostic Value of the Venous Pulse," by A. W. Hewlett.

The meeting was the largest in the history of the society, more than 80 members being present.

The following were elected to membership: T. G. Brodie, of Toronto; W. W. Hale, of Washington; W. A. Hewlett, of Ann Arbor; A. D. Hirschfelder, of Baltimore; A. Hunter, of Ithaca, N. Y.; D. R. Joseph, of New York; W. J. Meek, of Madison, Wis.; F. R. Miller, of Toronto; F. H. Scott, of Minneapolis; S. Simpson, of Ithaca; C. Voegtlin, of Baltimore.

The following officers were elected:

*President*—W. H. Howell.

*Secretary*—R. Hunt.

*Treasurer*—W. B. Cannon.

*Additional Members of Council*—A. J. Carlson, W. P. Lombard.

REID HUNT,  
*Secretary*

#### THE AMERICAN ASSOCIATION OF ECONOMIC ENTOMOLOGISTS

THE twenty-first annual meeting of the American Association of Economic Entomologists was held at the Eastern Female High School, Baltimore, Md., December 28 and 29, 1908. The annual address of the president was presented by Dr. S. A. Forbes, on "Aspects of Progress in Economic Entomology." A full program of interesting papers was presented at each session. A general discussion of the subject "Do we Need the Insectary?" was participated in by many of the members and many important facts were brought out in connection with the use of this important accessory to entomological work.

The report of the secretary showed that the association was making a healthy growth and that it was in a good financial condition.

A considerable amount of important business was transacted at the meeting which included a revision of the constitution, the adoption of a resolution defining the attitude of the association

concerning the proposed affiliation of societies interested in agricultural science and the adoption of memorial resolutions on the deaths of Dr. William H. Ashmead, Alexander Craw, Dr. James Fletcher, Professor W. G. Johnson and Professor F. H. Snow, members who had died during the past year.

A long list of uniform common names of insects were adopted on recommendation of the committee on nomenclature.

Thirty-nine new members were elected.

The following officers were elected:

*President*—Dr. W. E. Britton, New Haven, Conn.

*First Vice-president*—Dr. E. D. Ball, Logan, Utah.

*Second Vice-president*—Professor H. E. Summers, Ames, Iowa.

*Secretary*—Mr. A. F. Burgess, Washington, D. C.

*Member of the Committee on Nomenclature*—Professor Herbert Osborn, Columbus, Ohio.

*Members of the Advisory Board of the Journal of Economic Entomology*—Professor Wilmon Newell, Baton Rouge, La., Dr. H. T. Fernald, Amherst, Mass., and Professor Herbert Osborn, Columbus, Ohio.

*Members of the Council of the American Association for the Advancement of Science*—Dr. S. A. Forbes, Urbana, Ill., and Professor H. E. Summers, Ames, Iowa.

The attendance was the largest of any meeting in the history of the association, over a hundred being present at every session.

A. F. BURGESS,  
*Secretary*

#### SOCIETIES AND ACADEMIES

##### THE NEW YORK ACADEMY OF SCIENCES SECTION OF BIOLOGY

THE regular meeting of the section held at the American Museum on January 11, 1909, was devoted to an illustrated lecture by Professor E. B. Poulton, of Oxford University, on "Mimicry among North American Butterflies." The lecturer was introduced by Mr. Charles F. Cox, president of the New York Academy, who made some brief remarks on selection and mimicry.

Prior to the scientific program a letter was read from Mr. W. K. Gregory, regretfully declining the election to the secretaryship of the section for 1909. Dr. L. Hussakof was then nominated and elected to the office for the same term.